

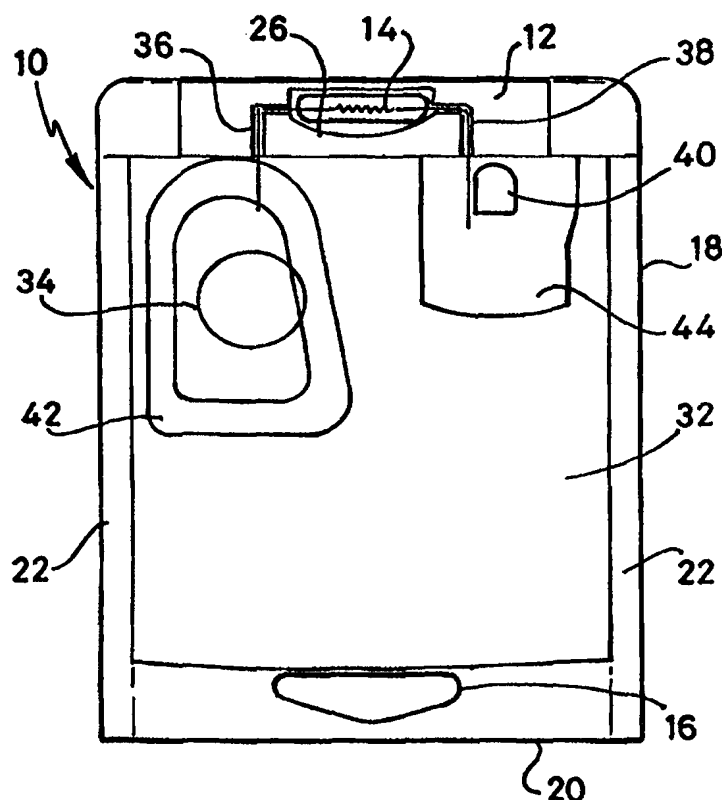


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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<b>(21) International Application Number:</b> PCT/GB99/03819 <b>(22) International Filing Date:</b> 17 November 1999 (17.11.99)  <b>(30) Priority Data:</b> 9825136.6 18 November 1998 (18.11.98) GB  <b>(71)(72) Applicant and Inventor:</b> SINCLAIR, Iain [GB/GB]; Willow House, Hildersham, Cambridge CB1 6BX (GB).  <b>(74) Agent:</b> KEITH W. NASH & CO.; 90-92 Regent Street, Cambridge CB2 1DP (GB).		<b>(81) Designated States:</b> DE (Utility model), ES (Utility model), GB, SE, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i>

**(54) Title:** FLAT TORCH AND MANUFACTURE THEREOF**(57) Abstract**

Disclosed is a flat torch (10) comprising a lamp housing (12), a flat battery (32), a switch (34) and a cover bag (18) enclosing said lamp housing, battery and switch except for an opening for light emission, the cover bag being peripherally sealed and sealed at its opening around the lamp housing.



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**Title Flat Torch and Manufacture thereof****Field of the Invention**

This invention relates to a flat torch and to a method of manufacture thereof.

**Prior Art**

A known flat torch has a substrate carrying a flat battery and miniature incandescent lamps enclosed within a cover having a cut-out in which is located a light transmitting insert through which in use light from the lamps is emitted.

A primary object of the present invention is to provide an improved and simpler construction of torch and a method of making the same.

**The Invention**

According to one aspect of the invention, there is provided a flat torch comprising a lamp housing, a flat battery, a switch and a cover bag enclosing said lamp housing, battery and switch except for an opening for light emission, the cover bag being peripherally sealed and sealed at its opening around the lamp housing.

According to another aspect of the invention, there is provided a method of manufacture of a flat torch according to which a lamp housing is wired to a switch and to a flat battery to produce an assembly which is then enclosed within a cover bag having an opening for light emission, and the cover bag is sealed at its periphery and at its opening around the lamp housing.

The lamp housing may carry one or more lamps, preferably a single incandescent lamp. Alternatively, one or more white LEDs may be employed.

Although the use of a single incandescent lamp is preferred, the use of a single white LED can be made possible by the invention subject of our copending Application No. 9807768.8 , according to which an LED with high internal resistance greater than 10 ohms at 50 mA current is overrun in excess of the nominal rated maximum voltage and current levels, causing the LED to emit much more light than is conventional without reducing its working life.

The cover bag may be glued or welded to seal its periphery and effect a seal around the lamp housing, dependent on the cover bag material, which typically may be thin card, thick paper, plastics sheet or metallic foil.

If metallic foil is employed, the cover bag requires to be electrically insulated at least from the flat battery contact wired to the lamp housing, for which purpose an area of insulation may be printed on the interior surface of the cover bag. However, it is also possible to use the metallic foil to complete the circuit path through the lamp and battery, utilising the flat cover bag as one contact of the switch, operable by virtue of the flexibility of the foil. An insulating foam or other electric, insulating insert may be used normally to hold the switch contacts apart.

Alternatively, a conventional dome switch may be employed for operation of the torch. In the case of a foil cover bag, its contacts will be electrically insulated from the bag.

In the lamp housing, a reflective strip may be incorporated behind the lamp to improve the illumination provided by the torch. The lamp housing itself will preferably be a clear plastics body which is produced by injection moulding.

A Lanyard/Euroslot cut-out may be provided adjacent the end of the torch opposite to the lamp housing, enabling the torch to be hung up when not in use.

### **Description of Embodiment**

The invention is further described with reference to the embodiment shown in the

accompanying drawings, in which:-

Figures 1A, 1B, 1C, 1D and 1E are respectively a front end view, a side view, an edge view, a rear end view and a perspective view of the torch, as seen on the exterior; and

Figures 2A, 2B and 2C are respectively a front end view, a side view and an edge view of the torch, showing the interior components.

Referring to the drawings, the flat, thin torch 10 is rectangular in shape, with a bulge of increased thickness adjacent the centre of its front end, where a lamp housing 12 incorporating a lamp 14 is accommodated. A Eurohook cut-out 16 is provided in the torch centrally adjacent its rear end.

The torch 10 comprises a cover bag 18, which may be of thin cardboard, thick paper or plastics sheet, but is preferably of metallic foil. The cover bag 18 is made of a sheet having a folded rear end edge 20, and side edges 22 sealed by gluing or welding. The cover bag 18 also has an opening 24, where the two sides of the sheet are sealed by gluing or welding around the lamp housing 12.

The lamp housing 12 is a component of clear plastics material produced by injection moulding and it carries a reflective strip 26 behind a single lamp 14, which is preferably an incandescent lamp. However, as hitherto explained, the lamp may be an LED of unusually high internal resistance, enabling it to be run at voltage and current ratings exceeding its nominal ratings, in accordance with the invention of our copending Patent Application No. 9807768.8.

Also enclosed within the cover bag 18 are a flat battery 32 and an associated thin switch mechanism 34. The lamp contacts of the lamp housing 12 are respectively wired, as indicated at 36, 38, to one contact of the switch mechanism 34 and to one contact 40 of the battery 32.

The switch mechanism 34 may be a conventional thin dome switch, but may be differently

constituted if a metallic foil cover is employed.

Thus, in the latter case, the foil cover 18 may be employed as one contact of the switch mechanism, with a stick-on foam insert 42 incorporated normally to keep the switch contacts apart. Operation of the torch is then enabled by squeezing the cover bag, utilising the flexibility of the metallic foil. The arrangement requires electrical insulation of the foil cover 18 from the contact of the flat battery 32 wired to the lamp housing 12, for which purpose insulation 44 can be printed on the interior surface of the foil cover.

It is not essential to the invention to employ a cover bag 18 of metallic foil. A thin dome switch can be employed inside a cover bag of thin card, thick paper or plastics sheet. It is of course desirable that the cover bag 18 is formed from, or coated with, an impermeable material so as to prevent the ingress of liquids (such as water) inside the torch. Both the metallic foil and the plastics sheet have the advantage of making the torch fully waterproof as well as crushproof. A plastics or foil cover bag can also be sealed by welding, whereas a card or paper cover bag would be sealed by gluing. The sealing of the cover bag 18 around the periphery and around the lamp housing is desirably such as to effect an hermetic seal.

In all cases, low cost, automated production of flat torches is enabled.

The exterior surface of the casing of the flat torch may be printed with advertising or other informative material.

**Claims**

1. A flat torch (10) comprising a lamp housing (12), a flat battery (32), a switch (34) and a cover bag (18) enclosing said lamp housing, battery and switch except for an opening for light emission, the cover bag being peripherally sealed and sealed at its opening around the lamp housing.
2. A torch according to claim 1, wherein the lamp housing comprises an incandescent lamp.
3. A torch according to claim 1 or 2, wherein the lamp housing is formed of a clear plastics material, produced by injection moulding.
4. A torch according to any one of claims 1, 2 or 3, wherein the cover bag comprises thin cardboard, thick paper, plastics sheet, or metallic foil.
5. A torch according to any one of the preceding claims, wherein the cover bag is sealed by gluing or welding.
6. A torch according to claim 4, wherein the cover bag comprises metallic foil, and wherein the foil forms one contact of a switch mechanism, the torch being provided with an electrical insulating material to prevent short-circuiting of the torch.
7. A torch according to any one of the preceding claims, wherein the cover bag is provided with a lanyard or cut-out to enable the torch to be suspended from a hanger or rack when not in use.
8. A torch according to any one of the preceding claims, wherein the exterior surface of the torch is printed with advertising or informative material.
9. A method of manufacture of a flat torch, the method comprising the steps of: making provision for switchable electrical connection between a lamp in a lamp housing and a flat

battery to produce a torch sub-assembly; enclosing the torch sub-assembly with a cover bag having an opening for light emission; and sealing the cover bag around its periphery and at its opening around the lamp housing.

10. A method according to claim 9, performance of which results in a torch in accordance with any one of claims 1-8.



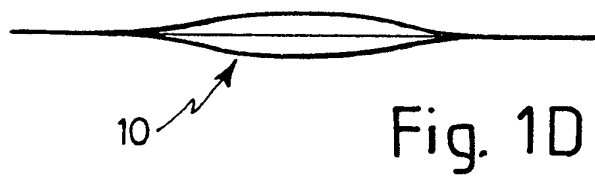
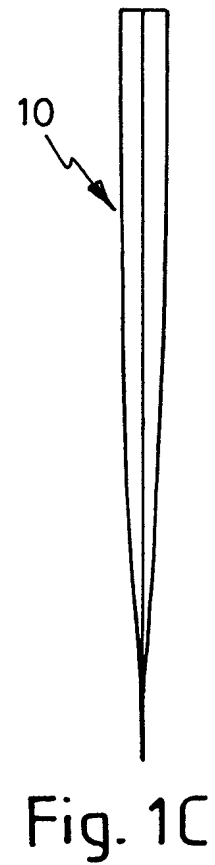
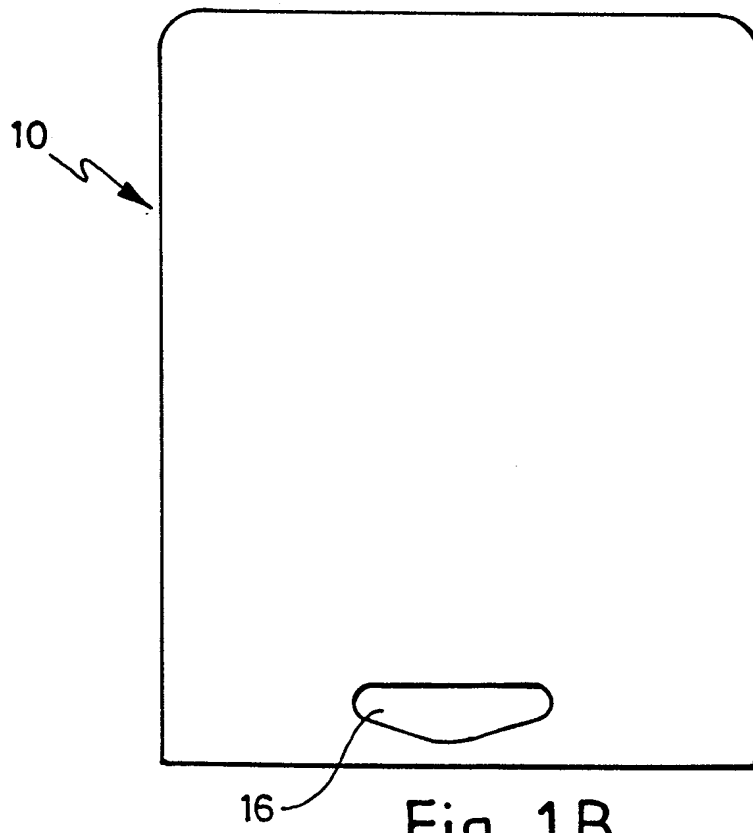
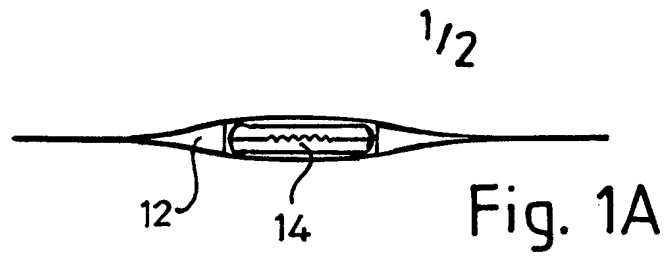
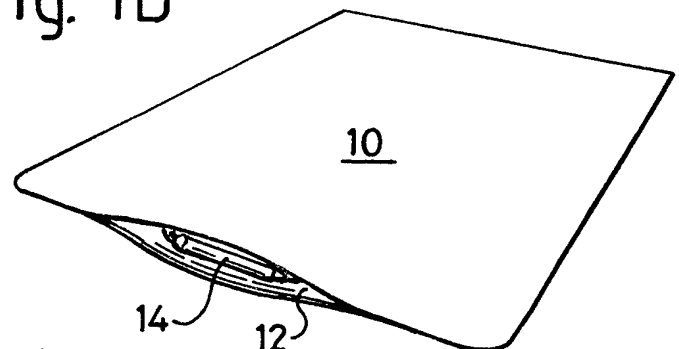


Fig. 1E



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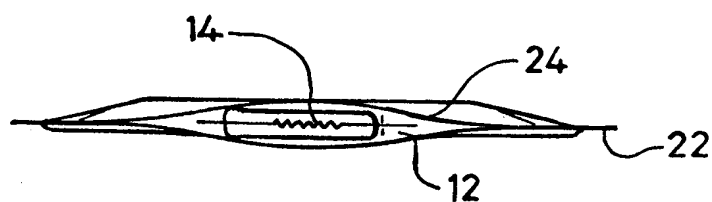


Fig. 2A

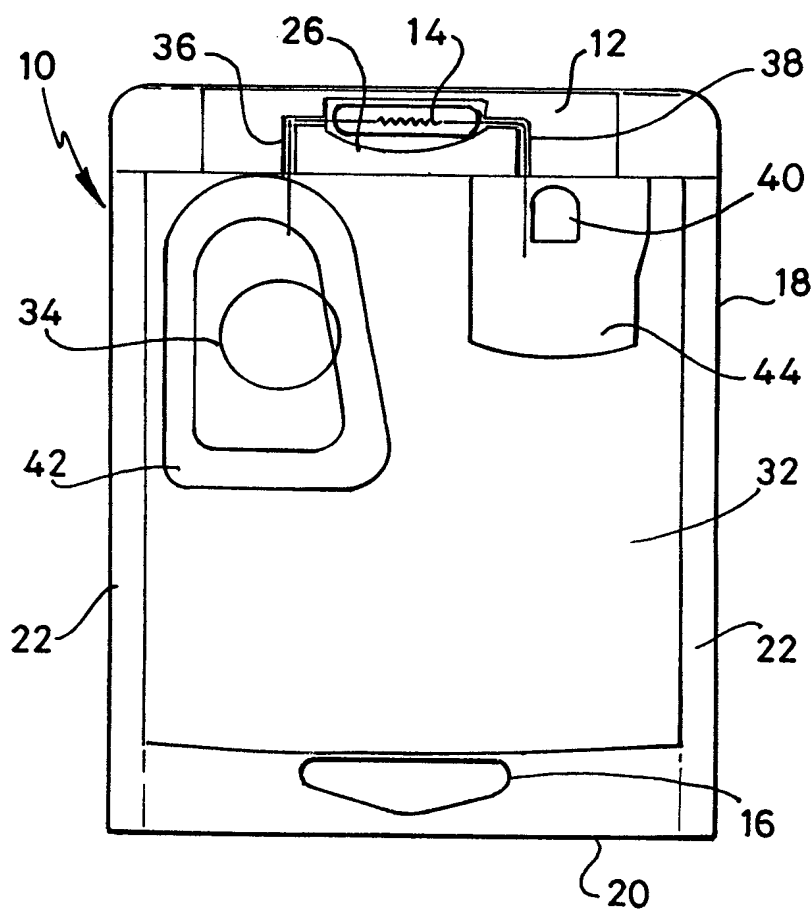


Fig. 2B



Fig. 2C

# INTERNATIONAL SEARCH REPORT

Internat Application No

PCT/GB 99/03819

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 F21L4/00 F21W111/10

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F21L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 638 219 A (BASCOUL OLIVIER) 27 April 1990 (1990-04-27) page 4, line 32 -page 5, line 7 page 5, line 14 - line 35 page 6, line 26 - line 31; figures 1,2,4	1-5,9,10
Y	---	8
Y	WO 98 50730 A (EVEREADY BATTERY INC) 12 November 1998 (1998-11-12)	8
A	page 2, line 5 - line 15 page 3, line 7 - line 17 page 4, line 11 - line 12; figures 1-3 ---	1,3,4
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☒ Further documents are listed in the continuation of box C.

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 521 833 A (WOLTER HEINZ) 4 June 1985 (1985-06-04) column 3, line 33 - line 40 column 3, line 61 - line 66 column 4, line 37 - line 41; figures 2,3,5 ----	1-3,7-10
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